

DEVELOPMENT OF WEB-BASED SERVICES FOR THE MARINE SCIENCES

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ABSTRACT: The advent of the Internet has brought many challenges and opportunities to the library and publishing communities and the end-users that they serve. Rapid increase in the levels of IT literacy of all parties has changed the way that the parties interact to disseminate information.

Elsevier Science has worked with the Scientists and Information professionals to research the needs of the scientific community. We are now developing products which balance the needs of the parent institutes to coordinate information delivery, with those of the more discipline-specific end user scientist. Putting theory into practice is where the real challenge starts. We have developed tools and processes which are undergoing constant revision. We have fought with copyright and authentication issues. Staff have had to be retrained and reskilled and whole new departments have been formed.

The Marine Sciences are characterised by tightly focused organisation of the Scientific discipline, dedicated departments, and library societies. In this field, publishing research and development has focused on providing a portal site for Marine Science which allows information to be accessed from a much broader database (ScienceDirect).

In this paper, the various issues are dealt with, and our new service "OceansDirect" is introduced

KEYWORDS: Online Journals; World Wide Web; Information Technology; Electronic Publishing; Market Research

1.0 Current trends

1.1 Trends in information access

Marine Scientists have the highest network Maturity in the Earth/Environmental science area. By this, we mean that Marine Scientists are heavy users of the Internet for data transfer and general communication. Our studies show that in early 1998, already 92% used e-mail/WWW daily or weekly, and 40% used information from WWW for their work.

MOST FREQUENTLY USED INFORMATION FROM WWW included:

- Reports of Governmental Organizations: 38%
- Online magazines/newsletters: 36%
- Publisher's Home pages: 30%
- Online Journals: 25%
- Commercial information: 20%
- Document delivery: 10%

Marine Science Libraries are following the trends, and reacting to provide appropriate services. Digital libraries are being developed at large institutions, and there is a high level of IT expertise amongst library staff. However, there are still some one-man libraries at remote locations, and library staff at such sites have particular difficulties in providing digital access. This is often overcome through networked access from "Parent" Institutions.

Subscription to online journals/A&I services is increasingly common, especially when a large number of subscriptions makes CD-ROM access unfeasible.

Online searching, once carried out mainly by library staff, is increasingly carried out by end-users and the librarian's role is often moving towards that of tutor and Help Desk.

1.2 Reaction of Publishers

Current trends towards electronic access of information and in particular the use of the World Wide Web for information transfer, have required publishers to respond with Services geared to the new and increasingly sophisticated requirements of their customers. The new opportunities for comprehensive customer service has also led many publishers to rethink their own organisations.

We have had to investigate current activities in the Scientific disciplines that we serve, and react to them in a way that is flexible enough to change in pace with community needs. Scaleable Information systems have had to be developed to accommodate an ever-increasing diversity of content, and to meet new billing and delivery requirements. Needless to say this has presented Publishers at all scales with an unprecedented array of challenges, but also new opportunities to work with the library communities to provide comprehensive and accessible services to end-user scientists.

Many publishers are improving existing products through WWW delivery. This may be through provision of searchable full text articles, and storage areas for "unprintable" supplementary information such as numerical data and program code.

In addition to electronic versions of their existing holdings, publishers are developing comprehensive WWW Cluster Products, and new stand-alone web titles devised for their most web-literate customers. The AGU, for example, has developed a code and data database, and an electronic-first journal *Earth Interactions*. Companies previously acting as agents have developed their own agglomeration services to offer delivery of electronic content for multiple vendors.

At Elsevier Science, key changes have included a Globalisation of traditional publishing units, which allows better coordination of discipline-specific services; a complete re-engineering of the production process and creation and refinement of WWW publication systems. For Elsevier, this has meant a total re-alignment of IT processes, and re-training of IT and Production staff. The result is a more streamlined and flexible production process which allows SGML to be created for all products, and structured storage of SGML products in an extensive electronic archive, the Elsevier Electronic Warehouse. This enables us to produce searchable full-text for our journals, plus Abstracting and Indexing services, TOCs on the WWW and e-mail alerting services, all from the same structured database.

For library customers, the most noticeable development was probably that of ScienceDirect and ScienceDirect onsite. These products provide institutions with access to A&I and full-text content from Elsevier and partner publishers. Integration of content allows sophisticated linking within the database, for example from references to abstracts and full text articles.

The new Computer Aided Production system and IT systems have also led to the provision of better services for our Authors. Authors' support is improved through the supply of better information, via our web site at the submission stage, and article tracking via the WWW using our Online Article Status Information System (OASIS). In addition we have developed a Virtual Editorial Workspace for e-submissions, a service which is particularly useful as we start to publish the supplementary non-text information.

2.0 Case study: Elsevier Science Marine Science Programme

For Elsevier Science, the developments in Web delivery can be seen by reference to the development of an integrated web site, and new electronic-first titles.

Market research into user requirements has included feedback at exhibitions and meetings, focus groups with a cross-section of the user community, formal questionnaires and log file analysis. The IAMSLIC group has been key in providing a customer perspective. Editors, Board Members and Authors provided access to the end-user community.

The concept of a Community web site, which offered free and paid for services was formulated. Particular requirements of the Marine Science community were the need for traditional information, but also the increasing need to disseminate and access non-print materials, such as numerical data and programme code.

2.1 Oceanline to OceansDirect

During 1998, a prototype web service, working title 'Oceanline' was developed and used to canvas feedback from the library and end-user community. The subscription-based content included:

- **Comprehensive A&I service** based on *Oceanographic Literature Review*, plus metadata "abstracts" from ES and external sources.
- **Primary information** - ES & external journal articles, from existing paper-based products, and new e-first titles.
- **Tertiary information** - ES & external newsletters and reviews
- **Non-text information**, which is either stand-alone (datasets, models, forecasts) or supplementary to journal articles.
- **Document delivery for non-Elsevier** content

The prototype was used in a series of focus groups, and in contact with individual customers, to gather feedback. Scripps Institute of Oceanography, Woods Hole Oceanographic Institution and Fugro Geos consultants hosted focus groups. Board meetings provided another major opportunity for feedback. The Author also drew on experience gained from the DALI Digital library project, conducted with the Southampton Oceanography Centre, together with discussions with faculty and staff at a number of further establishments.

Several factors became clear. The concept was in essence well founded; and the ability to store and access supplementary information was of importance to the end-user.

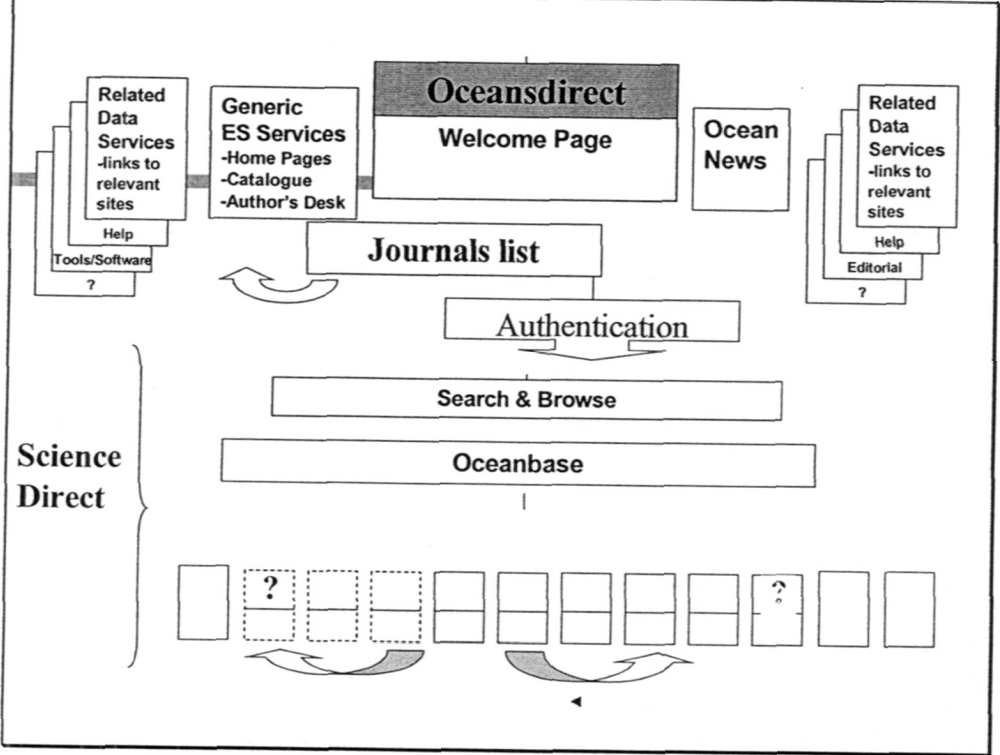
However, administration of a stand-alone product would be difficult for the libraries, when the parent institute may need to negotiate over a broad range of disciplines. For the larger organisation, Elsevier's much broader database product 'ScienceDirect', was of interest, and access and payment would need to be integrated with that. In addition, Marine Science papers appeared in a plethora of Journals, which were not dedicated specifically to Marine Science, and access to full text of these was very important.

The results were used to develop a new access model directly with staff at ScienceDirect.

In this system (see figure 1), a community portal web site for the Marine Sciences provides top-level services to customers, and help them to find their way around the underlying ScienceDirect database. An A&I product, Oceanbase, helps to guide the

customer around the ScienceDirect content.

Figure 1.0 Schematic Diagram for OceansDirect



For users, OceansDirect is a comprehensive offering of products and services. For librarians, it is a way for their users to access their ScienceDirect account.

Elsevier Science is looking at ways to make the ScienceDirect database more accessible for smaller institutions. Account Managers at the Regional Sales Offices work directly with libraries to offer access based on the libraries own holdings.

Further information on OceansDirect is available at Appendix 1.

In the second development phase, we have many options to extend the service. Improvements to the search and retrieval mechanisms for code and data are planned. A review of the scope of the A&I layer is in progress. For later development, we currently favour a Global non-text service with GIS-type interface, and we are considering an agency role.

The exact nature of further development will depend on the results of testing. One thing we do know is that the pace of change is so fast that flexibility must be built in.

2.2 Electronic-first journals

Marine Models Online (<http://www.elsevier.com/locate/mmol>)

Ocean Modelling (<http://www.elsevier.com/locate/omodel>)

Ocean & Atmospheric Data Management (<http://www.elsevier.com/locate/oadmol>)

Available as stand-alone products, or as part of the OceansDirect package, these are being developed to make full use of emerging technologies. For ***Marine Models Online*** for example, software is the core information being offered. Explanatory articles, much like technical papers, accompany the software. A pre-print service allows the information to be loaded onto the web three to four months prior to the full SGML and paper versions. A Print + CD-Archive will be provided as a supplement to *Progress in Oceanography*

Ocean & Atmospheric Data Management (OADM) is another new electronic plus paper journal. This title is dedicated to management of data from collection to distribution, and will include discussion on the metadata issues now familiar to IAMS LIC members. OADM aims to encourage information sharing and data submission, and will work closely with international data networks.

Ocean Modelling (OMOD) is a title which existed in grey literature form prior to 1999. *Ocean Modelling* was previously a rapid-response newsletter, produced solely in paper form, and intended for brief communications. Demand from authors for peer-review and the requirement for supplementary information has led to the publication of this title by Elsevier from 1999 onwards in association with the original editorial team. From 1999, *Ocean Modelling* will be a Web plus paper publication, fully peer-reviewed, with a Pre-print service.

3.0 Future Challenges

Publishers face many challenges in the face of changing needs and resulting products. For most, Authentication is one of the biggest headaches. E-commerce is definitely the way forward, but this is fraught with complex IT and security issues. Different customers want different modes of purchasing, and simple single-subscription models are becoming less and less attractive. We are refining our Authentication procedures to allow for this. Consortia purchasing is becoming commonplace, and demand for transactional billing is growing. Copyright issues are also cause for much debate - how can we permit reasonable use, and a degree of information sharing, without damaging our business and precipitating the million-dollar journal scenario?

Citation protocols have also come under scrutiny - when is an article not an article? Are pre-prints still *in-press*. Should citations for the electronic version of a journal be different from the paper version? How should we cite supplementary information that is present only in electronic journals? We have solutions to many of the above at least for now. One thing is certain however - they will definitely all change!

Annex

OceansDirect Product Outline

OceansDirect helps users to find their way around the international literature by providing free services, and links to paid-for services. End-users can access the free information without registration. Their librarian or information professional manages the paid-for services for them. Once the library has signed up for the paid-for services, access is transparent to the users.

Free services – accessed by end-users from the *OceansDirect* site:

- Free trial access to innovative new web journals for modellers and data managers
- News and views; Discussion groups; Calendar; E-mail alerting services

- *Information for Authors*
- *Links to a choice selection of related websites*

Paid-for services – based on the library's subscription holdings – accessed via a link from the *OceansDirect* site:

- *Oceanbase – comprehensive Abstracts database with links to:*
 - *Full-text Access to electronic versions of journals which your library subscribes to*
 - *Full-text access on a transactional basis for non-subscribed titles*
 - *Document delivery for over 300 additional titles*
- *Electronic Journal access – based on the libraries entitlement*

A skeletal prototype is available at the *OceansDirect* site. We are currently inviting our customers to provide input into development and welcome comments through the feedback form at the site.

How can I access OceansDirect?

OceansDirect = *ScienceDirect* + *Oceanbase* + *Free Community services*

News, product and community information is free. For full access to Abstracts and Journals, the library will need to be a *ScienceDirect* customer.

Existing ScienceDirect customers can add *Oceanbase* to their *ScienceDirect* account. Please contact your Account Manager to arrange for a free trial.

For new customers, details on *ScienceDirect* are enclosed. As an information professional, you need to sign up for a *ScienceDirect* account based on your current holdings, and add the *Oceanbase* A&I product (see reverse of this sheet) to enable your users to get access to the core content through *OceansDirect*.

If you would like to sign-up for a free trial of *OceansDirect* (*ScienceDirect* Journals plus *Oceanbase*), please contact your nearest regional sales office at the address overleaf.

OCEANBASE

Oceanbase is the bibliographic database for Marine Science & Technology. *Oceanbase* provides you with the entire contents of *Oceanographic Literature Review*, including *Ocean Data News* together with material from *Fluid Abstracts: Civil Engineering* and *Ecological Abstracts*. The file will run from 1993 to present. At 16th October 1999, only two years of data are loaded into the prototype, but we hope that this will show you the breadth and depth of coverage. The file 1993-present will be fully loaded by the year-end. An archive file, 1978-1993, may also be made available, depending on feedback received during the prototype phase. If you feel that the archive file would be useful to you, please let us know by providing comments through the feedback button at the site.

Coverage includes Physical Oceanography and Fluid Dynamics, Marine Meteorology, Chemical Oceanography, Marine Geology and Geophysics, Biological Oceanography, Marine Ecology, Pollution, Environmental Issues, Toxicology, Applied Oceanography, Remote Sensing, Coastal and Offshore Engineering, Natural Resources, Ports, Harbours and Shipping, Waste Management, and Policy and Law.

Records are sourced from over 3,000 journals, plus books, conference proceedings and reports. In addition, *Oceanbase* sources information from other electronic publications and the World Wide Web to provide you with entries detailing the availability of numerical data, related products, data management tools and software.

Features:

- Includes all fields of Marine Science, Technology and Engineering
- Over 50,000 records, with 12,000 abstracts added every year
- Monthly updates
- Selection and editing by subject-specialists
- Fully indexed

The *Oceanbase* prototype is now available on *ScienceDirect*. Please contact your nearest Regional Sales Office for further information.

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